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New Treatment Opportunity for Hypomotor Type Irritable Bowel Syndrome

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Abstract The beneficial effects of broccoli extract capsules in IBS have been studied, including pain relief, decreased inflammation markers, and improved bile secretion, as well as improved immune and neurohumoral mechanisms [8]. The pharmacological properties of broccoli have been studied, including antitumor, immunomodulatory, antidiabetic, antimicrobial, hepatoprotective, cardioprotective, and antioxidant effects. This type of cabbage is rich in fiber, low in calories, and rich in vitamins and minerals [6]. Among several directions of our study, special attention was paid to studying the antioxidant, antimicrobial, and most importantly, constipation-regulating properties of broccoli in patients with IBS.

Keywords Functional gastrointestinal diseases, Irritable bowel syndrome, Broccoli, Broccoli extract “glucobrassicin” capsules

1. Introduction

Functional gastrointestinal diseases (FGDs) are one of the most serious and still unsolved problems of modern medicine [1,2]. In terms of incidence, they occupy the highest places in general therapeutic and gastroenterological practice. The most common type of FGD is irritable bowel syndrome (IBS), which accounts for 10-20% of the total population worldwide [4,9]. Its prevalence mainly in the working-age population indicates its social significance. IBS is second only to organic diseases in terms of severity and complications, but the patient's quality of life is significantly reduced.

Despite the development of improved treatment methods for FGDs, it has been found that effective results are insufficient [1,5,7]. Clinical remission can be achieved in only 10% of patients, and a relative improvement in the condition in 30% of patients [3]. In the remaining 60% of patients, clinical symptoms of the disease continue to bother the patient.

Given the shortcomings of the standard treatment used in IBS above, there is a need to use natural herbal medicines as an adjunct to treatment.

According to the data presented in the literature, broccoli is significantly richer in biologically active substances than cauliflower and white cabbage. The most important biologically active compounds are sulforaphane and indole-3-carbinol, which inhibit the development of cancer at the molecular level. In terms of mineral content, broccoli occupies a leading position not only among other types of cabbage, but also among vegetable crops [8,10,11,12]. It has also been shown to contain phenolic compounds (flavonoids and hydroxycinnamic acids), carotenoids, vitamins A, C and K, sterols, minerals and fiber.

In addition, it contains proteins, essential amino acids, lipids and carbohydrates, which are among its main components, all of which are very important for health and are the reason for the demand and interest in broccoli as a main and by-products [13,14,15].

This study presents the results of using "glucobrassicin" capsules made from broccoli extract in addition to standard treatment for IBS.

2. Materials and Methods

The study was conducted in the gastroenterology department of the Bukhara Regional Multidisciplinary Medical Center in 2023-2024. The study included 40 patients of both sexes aged 18 to 59 years, who were undergoing inpatient and outpatient treatment for the hypomotor type of IBS. The average age was 39.87 ± 8.44 years. Patients included in the study corresponded to the categories of young (18-44 years) and middle (45-59 years) age according to the WHO classification.

Written consent for inclusion in the study was obtained from all patients. Inclusion criteria for the study:

- with IBS diagnosed in accordance with the "Rome III criteria";
- young and middle age according to WHO;
- patients who are not allergic to broccoli.

Exclusion criteria:

- if patients with IBS have "panic" symptoms;
- pregnancy and breastfeeding;

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- has an allergy to broccoli;
- patients who did not agree to participate in the study.

The patients who took part in the study were divided into the main group (20 people) - those who received broccoli "glucobrassicin" capsules in addition to standard therapy, and the comparison group (20 people), that is, those who received only standard therapy.

Standard therapy included mebeverine hydrochloride 200 mg twice a day, lactulose and amitriptyline 12.5 mg for 10 days as prescribed by the doctor.

In addition to standard therapy, the patient was prescribed broccoli "glucobrassicin" capsules once a day for 1-3 months, depending on the patient's condition.

The main active ingredient of 1 capsule of "Glucobrassicin" is "Broccoli" extract - 200.0 mg.

The dynamics of treatment was carried out for 1 to 3 months, depending on the completion of the treatment period of patients.

All patients underwent a standard clinical examination, general blood, urine, feces, biochemical blood test, colonoscopy.

All patients were examined using clinical symptoms, feces analysis and the GSRS questionnaire (gastrointestinal symptom assessment scale) to assess their quality of life. The shape of the feces was assessed using the Bristol scale.

A general clinical blood test was performed on a Sysmex analyzer (Japan). The condition of the colon mucosa was examined using an OLYMPUS colonoscope (Japan).

Statistical analysis of the study results was carried out using the standard STATISTICA 13.0 program and the Microsoft Excel 2010 office program. The results of the work are presented in international SI units. Parametric and nonparametric criteria were used to compare the clinical parameters of patients in the observed groups. The statistical parameters “mean” and “standard error” were used to evaluate the samples. The statistical significance of differences in average and relative values that obey the law of normal distribution was assessed using Student’s t-test. Differences at $P < 0.05$ were considered statistically significant.

3. Results

The majority (n=30 (75%)) of patients with the hypomotor type of IBS were diagnosed based on clinical symptoms before colonoscopy, while the remaining patients (n=10 (25%) were diagnosed after colonoscopy. The age of disease onset was 31.24±8.53 years.

The main complaint in all patients was abdominal pain (n=40 (100%)), and dyspeptic symptoms predominated in 4 (10%) patients. Abdominal discomfort bothered 82.5% (33) of patients. Patients also suffered from secondary symptoms such as fatigue, irritability, mood swings, sleep disorders, menstrual irregularities in women, sweating, increased salivation, and shortness of breath when excited. During the treatment, 90% (18) of patients in the main group normalized their stool form (according to the Bristol scale), while in the comparison group this effect was observed in 70% (14) of patients. Patients who received broccoli capsules as an addition to the recommended standard therapy showed a faster resolution of clinical symptoms compared to the control group. Abdominal discomfort, bloating, and a feeling of incomplete emptying after defecation decreased by almost the same percentage in both groups of patients (Table 1).

The dynamics of clinical symptoms was assessed using the GSRS questionnaire (where 1 point is the absence of clinical symptoms, 7 points are their maximum presence). In most patients (25 (62.5%)), the pain syndrome disappeared 7 days after the start of treatment, and in the remaining (15 (37.5%)) patients, the pain decreased (Table 2).

When analyzing the main clinical symptoms during treatment based on the GSRS questionnaire, it was noted that the symptoms of constipation and abdominal discomfort decreased significantly in the main group of patients compared with the comparison group (Table 3).

Table 1. The occurrence of dyspeptic symptoms in patients with hypomotor type of IBS

Clinical signs	Main group, n=20 (50%)		Comparison group, n=20 (50%)	
	Before treatment	After treatment	Before treatment	After treatment
Flatulence	17 (85%)	1 (5%)	16 (80%)	4 (20%)
Gurgling stomach	13 (65%)	1 (5%)	14 (70%)	2 (10%)
Constipation	20 (100%)	-	20 (100%)	2 (10%)
Feeling of incomplete emptying of the stomach	5 (25%)	-	4 (20%)	2 (10%)
Nausea	2 (10%)	-	2 (10%)	1 (5%)
Hiccups	7 (35%)	2 (10%)	8 (40%)	2 (10%)
Feeling of heaviness in the epigastric region	3 (15%)	1 (5%)	2 (10%)	1 (5%)
Bitter taste in the mouth	2 (10%)	-	1 (5%)	1 (5%)
Loss of appetite	1 (5%)	-	-	-
Heartburn	1 (5%)	-	1 (5%)	1 (5%)
Feeling of congestion in the throat	1 (5%)	-	-	-

Table 2. Evaluation of pain relief effectiveness according to the GSRS

Term	Main group, n=20 (50%) ball	Comparison group, n=20 (50%) ball
Before treatment	3,53±0,14	3,33±0,17
After treatment	*1,2±0,13*	1,78±0,16*

*Note: *on the right - reliability compared to pre-treatment results (p<0.05); *on the left - reliability compared to between-group results (p<0.05);*

Table 3. Dynamics of dyspeptic syndrome according to the GSRS

Group	Symptoms	Before treatment (score)	After treatment (score)
Main group	constipation	3,66±0,17	*1,37±0,08*
	flatulence	3,43±0,16	*1,48±0,06*
Comparison group	constipation	3,33±0,18	1,65±0,07*
	flatulence	3,38±0,16	2,04±0,17*

Note: *on the right - reliability for differences during treatment (p<0.05);
*on the left - reliability for differences between groups (p<0.05);

All patients after treatment noted a decrease in abdominal discomfort, bloating and a feeling of incomplete emptying. In patients of the main group, dyspeptic symptoms practically disappeared after treatment. It should also be noted that 30% of patients in the comparison group showed signs of drug tolerance to lactulose. Also, when assessing changes in the shape and frequency of stool according to the Bristol scale, patients of the main group showed effective results compared to the comparison group in the early stages, i.e. on the 6th-7th day, and no signs of addiction to broccoli capsules were observed.

4. Conclusions

The use of "glucobrassicin" capsules made from broccoli sprout extract as an adjunct to standard therapy in patients with IBD has high clinical efficacy, providing a high analgesic effect and normalizing intestinal motility, as well as increasing the effectiveness of standard treatment, reducing the number of days of hospitalization, prolonging the remission period, and reducing the need for medications.

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